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ABSTRACT

The theory of articulatory setting, originally published in 1964, is outlined and expanded on, drawing on experiences with Polish and English. The theory proposes that each language has a unique configuration of articulators accounting for or establishing the natural sounds of that language that give it phonological unity and differentiate it from other languages. Articulatory setting is the tongue's position relative to the teeth. In applying the theory to Polish articulation, it was discovered that English and Polish have opposite articulatory settings, illustrating four points about the theory: (1) although some parts of the tongue are in constant motion in speech, the tongue anchorage is firm and stable; (2) if it can be observed at all, the anchorage is particularly visible during vowel production; (3) the phoneme descriptions of a language must be expressed in terms of anchorage if they are to be useful; and (4) what results in language learning is a compromise between the settings of the native and target languages, producing a foreign accent. It is suggested that articulatory setting be explained to second language learners and be used as a teaching tool, to help students control articulation and work comfortably within each setting. Use of imitation should follow, not precede, students' understanding of articulatory setting. (MSE)

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A New Look at a Cause of Foreign Accent

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Edward T. Erazmus

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For some time linguists have had a workable explanation of foreign accent which can be stated in general terms as follows. The native language or mother tongue causes interference in the production of the target language. Phonemic systems are the product of neuro-muscular habits and the transfer from one system to another produces interference in the second language acquisition process. While this general account is plausible enough, its explanatory power is weak and does little to alleviate the problem of foreign accent. We need an improved theory based on phonological facts which would lead to a much faster acquisition of accentless speech in the target language. One such possibility is what I shall refer to as the theory of articulatory setting.

My source of information regarding articulatory setting derives entirely from the classical article by Beatrice Honikman entitled, "Articulatory Settings" (1964). Honikman does not disclose the sources of her information but the literature indicates that a concept of articulatory setting had vogue among European linguists around the turn of the century and that some slight interest persists in it currently. The article by Honikman seems to be relatively unknown and unappreciated. The notion of articulatory setting is rarely discussed or entertained by American linguists.

Stated very broadly, the theory of articulatory setting can be expressed in these terms: each language has a unique configuration of articulators which account for or establish the natural sounds of that language which give that language its phonological unity and which differentiate it from all other languages. This paper will illustrate how articulatory setting works in language and make some claims for its relevance in language learning and pedagogy.

In her article, Honikman describes the articulatory

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setting of English in phonetic detail, provides supporting evidence for it in the phonemic inventory of English, discusses outward facial features as correlates of internal settings and cites instances of its use in pedagogical situations. Though I have used her paper for years in applied linguistics courses, it is only in recent semesters while working with teacher trainees in a practicum class and observing my own articulatory performance that the full implication of articulatory setting has become evident. Thus, this article will rely heavily on personal narrative in providing an explanation of the role and nature of articulatory setting.

The essence of articulatory setting, very briefly, has to do with the position of the tongue relative to the teeth. Honikman describes the articulatory setting of English as being the anchoring of the back of the tongue to the upper molars laterally up to the area of the pre-molars with the remainder of the tongue, the tip and blade, resting on or suspended below the alveolar ridge. With this back anchorage, the tongue tip is positioned on the alveolar ridge and makes contact there for the high frequency consonants of English [t, d, s, z, n, l, r] the less frequent affricates [č, ǰ], and the so-called palatal fricatives [š] and [ž]. The tongue tip action for these consonants is well known phonetic datum in English. We are conscious of the tongue tip activity on the alveolar ridge but are completely oblivious of the attachment of the back of the tongue to the upper molars and that is the most important articulatory fact in the pronunciation of English since it determines all articulatory placements and actions.

The attachment of the back of the tongue to the molars is referred to as anchorage or tethering by Honikman, and anchorage is the secret of the articulatory setting in all languages. I claim it to be a universal feature. An anchorage is present in all languages and the particular anchorage of a language will account for the natural sounds of that language. The anchorage represents the fixed part of the tongue in relation to a specific tooth area while the remainder of the

tongue has freedom of movement and performs the major function of articulation. Thus, in English the back of the tongue is fixed at the upper back teeth while the front of the tongue moves quite freely.

The term, "anchorage," used by Honikman to describe the basic relationship of the tongue to the teeth is a fortuitous one I like to think of it in its nautical sense as a point of departure for a number of analogies. In one of these nautical senses we conceive of the semi-circle of teeth in the mouth as being all the ports of the world and the tongue a ship. If you wish to speak English you anchor the tongue at one position of the teeth and only that position; if you wish to speak Japanese, you anchor your tongue at an entirely different position, and so forth for every language in the world. It follows, then, that every language has its unique and specific anchorage, or, in another sense, its port or home base.

It is important to conceive of the anchorage for any language as rigid, inflexible, constant, fixed, and having precisely defined parameters. How else could hundreds of millions of people speak the same language and make the same sounds in precisely the same way as, for example, we do in speaking English in the United States? The anchorage analogy, however, seems to contradict our intuitions and observations that the tongue is in constant motion during speech and, if anything, it seems to be afloat in space in the mouth with only periodic tappings and closings against some surface for the consonants but that it is certainly not tied down somewhere. In the face of this picture of a continuum, the anchorage idea retains its validity since a ship anchored at a dock remains in constant motion though tied down, bobbing up and down, sidewards and forwards with the action of the water and the wind. Anchorage signifies tied down and stable but not motionless and this is the condition of the tongue in speech.

That the notion of tongue anchorage is alien to us and seems irreconcilable is well evidenced by natural reactions. In

my classes some native American speakers will vociferously deny that they feel any contact between their tongue and the upper molars. The phonetic training students have had disposes them poorly to accept this fact. Foreign student trainees I have dealt with are just as reluctant to accept an articulatory setting theory, particularly the anchorage for English, and find it very difficult to describe the articulatory setting in their own language. This is not surprising. Tongue anchorage is so normal and natural to us that we experience no sensation of it. It is as natural to us as the ears hung on the sides of our head, of whose function we have no sensation until we experience pain or discomfort in them. If we are aware of our ears at all, they feel suspended in space, but they are firmly fixed to the sides of our head as we all know. So it is with tongue anchorage.

Though the Honikman article has been a favorite of mine for years, its full implications were only recently realized and came about in the following way. I am a natural bilingual, that is, my parents were immigrants, and in early childhood in the home I learned two languages, English and Polish. While being a bilingual is interesting, it is not all that jolly a road to travel in life linguistically, for there are problems of language disfunction associated with bilingualism which can be a plague to the bilingual. At any rate, while experimenting with articulatory settings with my teacher trainees, I decided to apply the principles of articulatory setting to Polish. There was an amazing revelation. It was difficult to believe at first, but there was a tongue anchorage in Polish and it was 180 degrees removed from that of English. In polish the tip of the tongue anchors at the gum line at the base of the front teeth with the blade arching up and outwardly and resting laterally on the upper side teeth. Because this anchorage is in the front of the mouth it is relatively easy to demonstrate and for others to imitate. I have had students who, having never heard a word of Polish in their lives, after a brief introduction to articulatory setting produced acceptable and native-like Polish the first time they uttered Polish words while mimicking and reading pho-

netically transcribed Polish. The implications for language learning are considerable, for the big monster in second language learning is the phonological component.

In Polish, with the tongue firmly anchored in front, consonants which are alveolar tongue tip in English like the [t] ot [n] phonemes are occluded by the blade or midpart of the tongue touching the back of the upper front teeth and arching on upward to the alveolar ridge. Thus, the phone [t] in the word "tam," meaning "there," is made with the tongue tip on the front lower gum line with the blade touching not only the alveolar ridge but resting on the back of the upper front teeth. For the [a] phone the jaw drops considerably, with the tongue still anchored on the lower teeth but releasing from its occlusion for the [t]. Finally, for the [m] the lips are pulled in for the closure because the tongue is still front anchored and prevents the jaws from closing tight.

Contrast this with the phonologically corresponding English word, the name, "Tom." With the blade or back tongue anchorage on the upper molars laterally, the tongue is spread out to form an arch across the teeth. Holding this anchorage, the tongue cannot move far forward in the mouth, the tip resting on the alveolar ridge. The tongue tip is like a little door swinging back and forth with its hinges located on the upper pre-molars. The [t] is occluded sharply and is followed by aspiration. The [a] in "Tom" commences and the tongue tip swings down. The jaw drops slightly for the [a] but the back anchorage holds firm. Finally, for the [m] occlusion, the lips close lightly and the tongue does not move at all inside the mouth, that is, the anchorage is maintained. Both words in broad phonetic transcription would be written [tam] but the articulation is totally different and the resulting sounds are different, though there is considerable overlap.

This short phonetic description in two languages illustrates several things about articulatory settings.

(1) Though some portions of the tongue are in constant

motion in speech, the tongue anchorage is firm and stable. The more one observes and works with anchorage phenomenon the more is one impressed by its constancy and invariability.

(2) If it can be observed at all, the anchorage is particularly visible during vowel production, for the mouth is open at that point and the tongue is in a neutral position as far as consonant occlusion is concerned. During consonant articulation there is interplay between the anchorage and the moving part of the tongue while in vowel production the anchorage is in control.

(3) The descriptions of the phones of a given language have to be done in terms of tongue anchorage if such descriptions are to have any relevance for practical purposes.

(4) Considering the totally different settings of Polish and English and the highly refined function of each, it would be nothing short of a miracle for an adult Polish learner to discover the settings of English by imitative pronunciation alone and, vice versa, for the English learner of Polish. What results in language learnings is a compromise of the settings of the target language with the resultant production of a foreign accent. Foreign accent, thus, is a production of the sounds of one language with the settings or the modified settings of another. Some people can very adroitly produce the sounds of one language with the settings of another, at times with charming results as some actors are capable of doing, but it is still a foreign accent with all the problems it entails.

The presence of foreign accent in the speech of a learner is a symptom of language disfunction and should not be tolerated in language teaching, if possible. Under present teaching conditions, in imitating the speech of another

language we simply produce the recognizable sounds of the target language with our native tongue setting and the outcome is an accent of varying degrees of success through a long, hard struggle of listening and imitation our tongue setting may gradually begin to approach that of the target language. It is not surprising at all if students never fully reach the natural setting of the target language, for at present we have little knowledge of the pronunciation facts and can offer little to help the learner. One learns the setting by osmosis.

What then are some implications of articulatory setting theory for language pedagogy? There is nothing as hard and rigid in the body as the teeth and nothing as flexible as the tongue. In articulatory setting theory the teeth are the setting points and the tongue accomodates to the teeth. The resulting settings of a natural language determine the phones and the phonemes of the language; and, conversely, the phones and phonemes shape the articulatory settings. It is a two-way, mutually interacting process. This is the classical question of what comes first, the chicken or the egg? From my perspective, for pedagogical purposes, the setting clearly takes precedence. In our present imitative, audio-lingual practice with native models, the direction is the opposite, that is, the heard phonemes are used to shape the articulators. This is a backwards model and the difficult and painful way to do it. In the ideal situation the tongue anchorage should be explained, demonstrated, checked out and set up before a single word in the second language is attempted by the learner. This should not be a difficult task because the tongue can be adjusted in some gross way to any position in the mouth with ease. Securing an anchorage of the tongue to a point on the teeth is a fairly simple matter. With the tongue in place, the words and phrases of the target language can be presented to the student. The learner should be made constantly aware of two settings, the one of his own language and the one of the other language. With conscious practice he can learn to keep the settings separate and work comfortably in both modes.

If I were to teach Polish, I would establish the articulatory setting before I attempted a single word of mimicry in class, and from then on when speech forms are introduced maintain strict supervision over production. This appears easy to do because Polish is a front anchoring language with a good view of the anchorage possible. Unfortunately, not all languages have so accessible an anchorage to work with, English being one of the more difficult. English anchorage is difficult to view visually because it is obscured by the front of the tongue resting on or near the alveolar ridge which blocks the view of what happens in the interior of the mouth. However, lip and jaw setting and the heard phones are some indicators as to whether the English anchorage is being approached by the learner. From casual conversations with students discussing their native languages, it appears that the Arabic tongue anchorage is at the low back molars; Chinese anchorage is at the low back teeth, somewhat lax; and Japanese is at the low front teeth and tense. This is gross data and suggests merely that settings can be determined in every language.

Most competent bilinguals are probably unaware of functioning with two discrete articulatory settings, which they certainly are. With a knowledge of articulatory setting at our disposal we can operate with full consciousness of the two settings. As a natural bilingual, I note in my speech the pull of one setting on the other and a tendency of the settings to contaminate each other or cross-over. With a conscious knowledge of the two systems and their parameters it is possible to monitor and control cross-over. On the whole, we are poor judges of our own speech performance. Of the group of foreign teacher trainees I am currently working with, the English speech of the best of them could be markedly improved, and the most deficient is quite bad. Yet I sense that they think they are doing quite well. How can you tell them differently? With a rational knowledge of articulatory setting and the way it works and can be controlled, we may someday work ourselves out of this impasse

of being secretive about important things.

If articulatory setting is a rigidly determined factor in each language how do we account for dialectical differences and the individual differences among speakers of a language? First of all, let us consider dialectical differences. As we might surmise, dialectical differences are the result of slight adjustments in the base articulatory setting of a language, held in common by a set of speakers who are usually grouped together along geographically determined lines. To give support to the theory of articulatory setting, I perform the following experiment involving dialects with my students.

We are aware of r ther large phonetic differences in British and American speech. To illustrate differences and their bearing on articulatory setting I demonstrate imitated British speech and tell the students how to do it and then have them do it. This is the way it works. To produce a British accent clamp your jaws almost tight, spread your lips in a thin line, draw the tongue far back from its natural setting for American speech on the alveolar ridge, hold it there quite rigidly and begin to say sentences. If you can control these positions you emerge with something of a so-called British accent. It's quite automatic. It takes no training, just a little conscious control. In the emerging speech you swallow syllables, produce strange stress patterns and indescribable intonations, drop post-vocalic r's as if you were born with the knack, and introduce all kinds of peculiar registers. Why? The answer is, you have adjusted your articulatory settings and there is no other way you can speak English with these new settings except with a British accent. You can't do otherwise. Although the exercise is a bit embarrassing to students each of them gives it a try for their classmates with some moderate success.

From this experiment we can draw several conclusions bearing on articulatory setting theory.

(1) Articulatory setting can be likened to a musical horn: change the shape of the horn and you get a different sound. Change the setting in a certain direc-

tion in a language and a different dialect emerges in full bloom.

(2) The major matter to be noted here is that with the proper setting in place for a language or dialect all the phonology falls into place automatically, that is, not only the segmental phonemes but all the suprasegmental phenomena, the stresses, pitches, junctures, and whatever else is present phonologically in speech. In other words, with the proper setting one can't make a mistake or deviation in the language on the phonological level. It is all automatic. So we can see, for example, why a British speaker cannot make a retroflex "r" in post vocalic position. He would literally choke to death trying to do so, not because he is stuck up as we Americans are inclined to think, but because it is physiologically impossible due to the setting of the tongue far back on the alveolar ridge.

(3) If speaking a variant dialect is as simple as illustrated above, the day may come when we can choose at will our accents, that is, British, Southern and Eastern American, Canadian Scotch, Irish, or whatever.

As for ideolectical or personal differences in speech, there are as numerous as there are speakers in the language. When once the parameters of the settings of a language are defined, we see that each individual plays the tune a little differently as there are enough physiological and psychological variables at work to make an identical speech product among individuals an impossibility. To illustrate, at a teacher staff meeting recently I observed the speech of two assistant instructors, both Kansans and native speakers of English. One male has a loud, slow, carefully articulated, clear speech. This inordinate overarticulation I took to be an effect of forwarding, that is, the tongue is moved forward on the front-rear axis in the mouth. The consequence is that the jaw drops down farther than normal to accomodate the tongue; the mouth is wider open, the tongue is more visible, speech slows down as a result of the more prominent

articulatory movements, and he was even noted to produce an occasional interdental "th," which is unusual to observe in colloquial speech. His speech seems a bit overarticulated and affected but it does have its engaging qualities.

The second example is that of a young lady. Her jaws are almost clamped tight during speech. The tongue on the back-to-front axis is forward. Her lips move prominently, much more than for the normal speaker. She speaks rapidly with a rather sing-song pitch. This behavior seems to illustrate that if the tongue is forward and jaws closed, the burden of articulating the message falls on the lips which become hyperactive. The point of these cases is that a base articulatory setting gives us the freedom as individuals to make adjustments in our articulatory usage, but that, having opted for certain behaviors, compensatory, predictable shifts of various kinds will take place in the output.

In the discussion of dialect, I asserted that when the articulatory setting of a language is secured the entire phonology falls into place easily and naturally. However, it would take much practice to gain mastery and control over the articulatory setting of another language to the point that we could use it normally and fluently in speech. Because of the presence and drive of the more dominant native language setting, regression and forgetting occur rapidly if practice is not sustained. The pedagogical road is not easy and achieving the articulatory setting in some languages will be more difficult than others. However, if the learner's articulatory setting is not correct, he has an accent, his phonology is bad, stress is bad, intonation is bad, juncture is bad, lexicon is bad, syntax is bad, semantics is bad, communication is bad, etc. We cannot overemphasize the effect phonology has on the rest of the system in the spoken language.

Back in the 30's and 40's, in the reading-translation days of language teaching when I was a student of French, the learner was largely concerned with visual translation, that is, finding equivalents for the target language appearing on the printed page. We almost totally ignored speaking, listening, and free writing in the target language. The activity

may not have been exciting but it was entirely within the capacity of intelligent people, and we did learn to read something. Today, with the advent of the audio-lingual method, in addition to the translation task mentioned above, the learner is confronted on the first day of class with a flood of incomprehensible sounds which in itself is a shock. Beyond the admonition to listen and repeat, we offer no help whatsoever to the learner in this area. It's a sink or swim proposition. It is no wonder that for most people language learning is a traumatic and frustrating experience and that language teaching, rather than blossoming in the international age we are now living in, is slowly but surely going under in our schools at every level, as decreasing enrollments in language programs indicate.

Learning a second language should be a joyful, interesting and exhiliarating experience, at least for people with good will and ordinary acumen. Trying to produce the sounds of language X with the settings of language Y is a dehumanizing experience, fraught with all kinds of frustrations. The numbers of students that will willingly step up and take the pounding is gradually diminishing. There ought to be some easier way to do it, and I suggest a re-examination of what happens with our articulators in the speech act as a starting point.

This paper has been anecdotal in nature. Scattered through it have been a number of principles regarding articulatory setting which I would like to summarize at this point. While I state them with a certain degree of assurance, they still need proof and verification.

(1) Articulatory settings determine the particular sound system of a language.

(2) The center of the theory of articulatory setting is the anchorage of the tongue. The anchorage of a language is the fixed position of one portion of the tongue to a given position on the teeth.

(3) Anchorage is a universal feature, that is, it applies to all languages.

(4) With the anchorage established all other movements of the tongue and articulators follow in a secondary fashion.

(5) The static anchorage position is easily determined and easily approximated in languages.

(6) With the tongue in anchorage position for the target language, the speech of that language can be easily and effectively imitated.

(7) The performance of the sounds of one language with the settings of another does violence to language, impedes learning and causes frustration and hardship to the learner.

(8) The performance of the sounds of another language with the natural articulatory setting of the language is pleasurable, fascinating and engaging. It relates directly to the particular beauty of that language.

(9) Individuals can operate fully consciously with different settings and keep them discrete when learning them and in code switching.

(10) Dialects of a language represent slight modifications of the base settings of the language and these can be described accurately.

(11) Within the parameters of the articulatory settings of a language the individual speaker adjusts the settings to his own physiology, personal needs and perceptions.

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